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CASE REPORT

Nasopharyngeal carcinoma with pericardial metastasis

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Abstract Nasopharyngeal carcinoma (NPC) is prevalent in Taiwan and is characterized by a high frequency of nodal metastasis. The most common organs with distal metastases are the bones, lungs, and liver, with extremely rare cases to the pericardium. Herein, we report a rare case with NPC who presented with dyspnea and orthopnea. Serial studies, including pericardial biopsy, revealed NPC with pericardial metastasis and pericardial effusion. The tumor cells of both the original and metastatic tumors were positive for Epstein–Barr virus by *in situ* hybridization. This is the first histologically confirmed case of NPC with pericardial metastasis.

Introduction

Nasopharyngeal carcinoma (NPC) occurs in Taiwan with an annual incidence of 5.4 per 100,000. It is clinically distinct from the other malignant head and neck cancers by a higher rate of nodal metastasis, a unique histopathology (frequently undifferentiated or lymphoepithelioma-like carcinoma), and greater sensitivity to radio- and chemotherapy [1]. Bones, lungs, and liver are the most common sites of distant metastases [2,3]. Pericardial metastasis is extremely rare, with only one reported case so far, but devoid of histolopathological confirmation [4]. Herein, we present the case of a young adult man with NPC and biopsy-proven pericardial metastasis.

Case presentation

In October 2004, a 25-year-old male patient was admitted because of a gradual onset of shortness of breath with orthopnea and exertional dyspnea for a few days. Physical examination revealed mild fever, tachypnea, and jugular vein engorgement. Chest radiograph showed bilateral lung nodules and cardiomegaly. Laboratory examination showed mild anemia (hemoglobin at 10.3 g/dL) with normal

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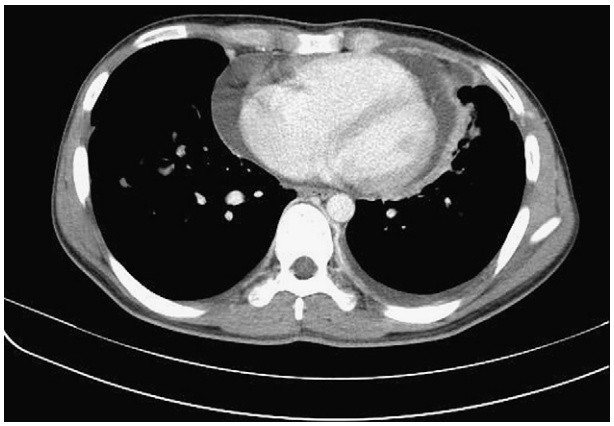

Figure 1. A computed tomography scan of chest with contrast enhancement shows pericardial effusion with pericardial thickening.

leukocyte and platelet counts and normal levels of biochemistry. Echocardiography revealed a moderate amount of pericardial effusion without collapse of the right atrium or ventricle. Computed tomography (CT) scan of the chest showed a large amount of pericardial effusion, pericardium thickening, and some metastatic nodules in bilateral lung fields (Fig. 1). Pericardiectomy with biopsy was performed, and a chest tube was inserted. The chest tube was removed 12 days later when his condition improved, and he was discharged on the same day. Two months later, a follow-up chest CT scan showed minimal pericardial effusion and progression of pulmonary metastasis. He received four courses of palliative chemotherapy with fluorouracil and leucovorin in early 2005. Unfortunately, he died of progressive disease in late April 2005, 6 months after pericardial biopsy and 43 months after the initial diagnosis of NPC. An autopsy was not performed.

Tracing back his history, in June 2001, when the patient was 22 years old, he suffered from right facial numbness for a few days with deviation to the right side when protruding his tongue. A CT scan of the head and neck showed a 3-cm right nasopharyngeal tumor with upward invasion to the right cavernous sinus and multiple enlarged lymph nodes in the bilateral posterior cervical triangle and bilateral carotid sheath spaces. Fibro-optic examination of the nasopharynx with biopsy revealed an undifferentiated carcinoma. Staging result was IVA (T4N2M0) according to the criteria of the American Joint Committee of Cancer. He achieved complete remission after concurrent chemoradiotherapy comprising cisplatin and 7,020 cGy of radiation to the nasopharynx and upper neck, 6,660 cGy to the cranium, and 5,940 cGy to the lower neck. Unfortunately, in March 2003, he complained of back pain, and a bone scan showed a bony metastasis at the thoracic spine. He

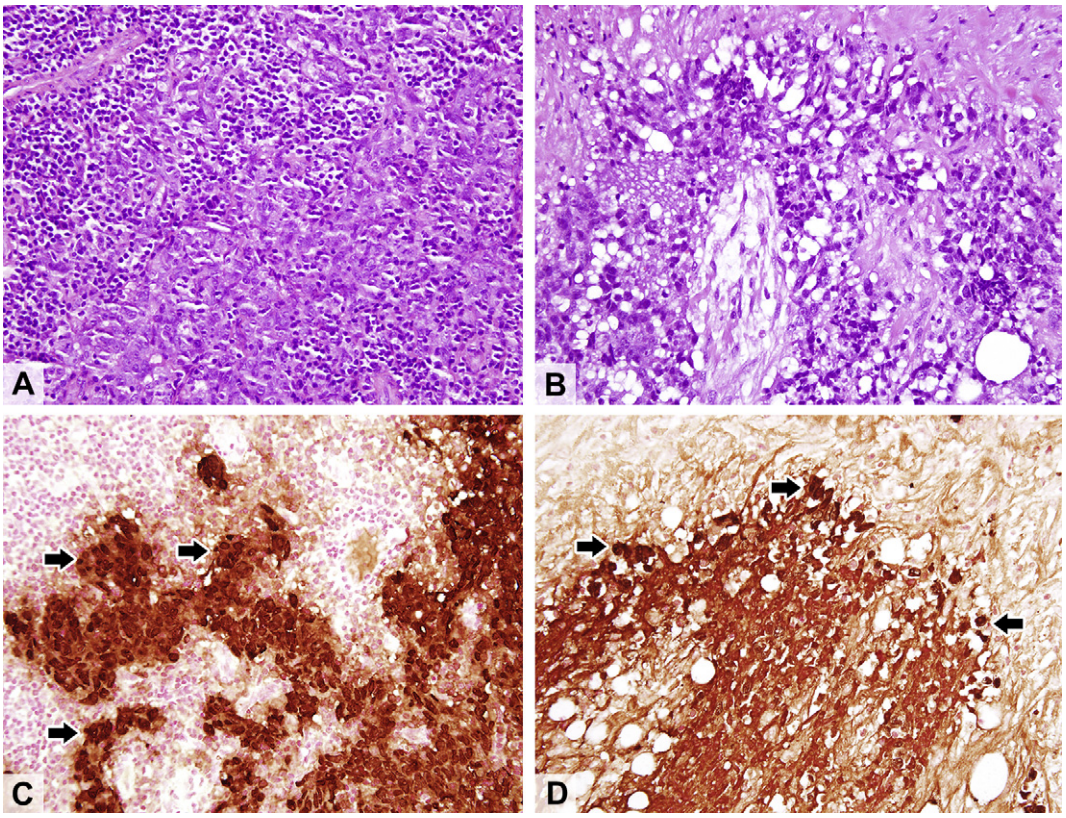

Figure 2. Photomicrographs of (A and C) nasopharyngeal and (B and D) pericardial biopsies. (A) The nasopharyngeal biopsy shows cohesive sheet and islands of tumor cells with a rich lymphoid stroma. (C) The tumor cells are positive for Epstein—Barr virus by *in situ* hybridization (EBV-ISH; arrows). (B) The pericardial biopsy shows similar cancer cell nests in a fibrotic stroma. (D) The tumor cells are also positive for EBV-ISH (arrows).

received local radiation with 4,000 cGy and achieved complete resolution of the lesion. A second bony relapse at the spinal column and bilateral sacroiliac bone occurred in July 2004, and he received additional 4,000 cGy of radiation to the spine with, again, complete resolution.

Review of the original nasopharyngeal biopsy showed an undifferentiated carcinoma comprising sheets and islands of polygonal tumor cells admixed with small lymphocytes (Fig. 2A). The pericardial specimen demonstrated a similar histopathology with islands of undifferentiated tumor cells with stromal fibrosis (Fig. 2B). *In situ* hybridization for the Epstein—Barr virus (EBV)-encoded mRNA was performed in an autostainer (Bond MAX; Vision BioSystems Ltd., Mount Waverley, Australia) using a polymer-based detection system (Bond Polymer Refine Detection; Vision BioSystems Ltd.) with an EBV-specific probe (Bond ISH EBER Probe; Vision BioSystems Ltd.) and 3,3'-diaminobenzidine as chromogen. The tumor cells in both the original NPC and the pericardial metastasis revealed positive nuclear signals (Figs. 2C and 2D).

Discussion

NPC is notorious for its predilection for both lymphatic and hematogeneous spread. It is clinically distinct from cancers of the oral cavity and oropharynx by a high frequency (up to 80—90%) of regional nodal metastasis at presentation, with bilateral involvement in approximately half of the patients [1]. Furthermore, distant metastasis is common [2,3]. Reviewing 256 patients with NPC, Ahmad and Stefani [2] found a 36% overall incidence of distant metastases and 51% in the autopsies. Bones (48%), distant lymph nodes (43%), liver (36%), and lungs (31%) were the most common sites of distant metastases, whereas liver was the most common site in autopsies [2]. In a retrospective study of 90 patients from Hong Kong who developed distant metastases after radical radiotherapy for NPC, Leung et al. [3] found that the skeleton was the commonest site of distant metastases, and the median survival of all patients with distant metastases was 8 months. Liu et al. [5] reported that the prognostic factors affecting the outcome of NPC patients in Taiwan included tumor stage, nodal status, and cumulative radiation dose to the primary tumor, and furthermore, distant metastasis was the main prognostic factor on survival.

Primary tumors of the heart and pericardium are extremely rare, whereas secondary or metastatic pericardial tumors are not uncommon, with most of the secondary tumors arising from primary cancers of the lung, breast, stomach and esophagus, and hematological malignancies [6]. Pericardial metastases have been reported from rare primary cancer sites/organs, such as oral mucosa, uterine cervix, urinary bladder, and sigmoid colon [7—10]. NPC is extremely rare as the primary cancer with pericardial metastasis. To the best of our knowledge, there is only one such case in the English literature in which the patient presented with cardiac tamponade; however, the diagnosis was made clinically without tissue proof [4]. Our patient is the first case of NPC with pericardial metastases confirmed by pericardial biopsy, and our diagnosis was further supported by EBV *in situ* hybridization.

References

[1] Mendenhall WM, Riggs CE, Cassisi NJ. Treatment of head and neck cancers. In: De Vita Jr VT, Hellman S, Rosenberg SA, editors. Cancer, principles and practice of oncology. 7th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2005. p. 710—3.

[2] Ahmad A, Stefani S. Distant metastases of nasopharyngeal carcinoma. A study of 256 male patients. J Surg Oncol 1986; 33:194—7.

[3] Leung SF, Teo PM, Shiu WW, Tsao SY, Leung TW. Clinical features and management of distant metastases of nasopharyngeal carcinoma. J Otolaryngol 1991;20:27—9.

[4] Li CP, Chi KH, Liu JM, Wu MF, Chen KY, Chan WK. Nasopharyngeal carcinoma with cardiac tamponade. Am J Otolaryngol 1994;15:307—9.

[5] Liu MT, Hsieh CY, Chang TH, Lin JP, Huang CC, Wang AY. Prognostic factors affecting the outcome of nasopharyngeal carcinoma. Jpn J Clin Oncol 2003;33:501—8.

[6] Mukai K, Shinkai T, Tominaga K, Shimosato Y. The incidence of secondary tumors of the heart and pericardium: a 10-year study. Jpn J Clin Oncol 1988;18:195—201.

[7] Schwender FT, Wollner I, Kunju LP, Nakhleh RE, Chan KM. Squamous cell carcinoma of the buccal mucosa with metastases to pericardial cavity, lung and thyroid. Oral Oncol 2002; 38:114—6.

[8] Jamshed A, Khafaga Y, El-husseiny G, Gray AJ, Manji M. Case report. Pericardial metastasis in carcinoma of the uterine and cervix. Gynecol Oncol 1996;61:451—3.

[9] Fabozzi SJ, Newton JR, Moriarty RP, Schellhammer PF. Malignant pericardial effusion as initial solitary site of metastasis from transitional cell carcinoma of the bladder. Urology 1995; 45:320—2.

[10] Lattuada S, Saggia C, Biaggi G, Santagostino A, Forti G, Manachino D, et al. Pericardial metastases in a long-surviving patient with sigmoid carcinoma. Tumori 2005;91:101—2.